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ABSTRACT

For seven years, the PREP (Preparation through Responsive Educational Programs) Project maintained behavior learning programs for highly disruptive and skill-deficient juveniles in a suburban, a rural, and an urban school. Forty-one volunteer teachers were taught to use specific procedures for academic and social skill training. Followup was conducted to determine which of the trained skills were retained by teachers and extent of environmental support for them. The obtained data indicated substantial maintenance of teaching skills, while behavior management procedures were less supported and maintained. However, the teachers continued to practice a number of procedures developing basic skills and classroom control without school support. Significant differences for overall maintenance were found between school sites, behavior principles knowledge, and type of teaching assignment.
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Assessing Teacher Skill Maintenance After
Behavior Training: Multi-Year Followup

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Assessing Teacher Skill Maintenance After
Behavior Training: Multi-Year Followup

For more than a decade, researchers have advocated assessing generalization and maintenance of treatment effects in behavioral programs (Baer, Wolf, & Risley, 1968). Recent reviews (Wildman & Wildman, 1975) and reports (Friedman, Filipczak, & Fiordaliso, 1977; Russo & Koegel, 1977) indicate that systematic attempts have been made to assess maintenance of trainees' behavior outside the treatment setting, including several years later (McCombs, Filipczak, Friedman, & Wodarski, 1978). However, trainee followup evaluation stops short of that required to determine the larger social impact of a treatment program.

Stokes and Baer (1977) reviewed the current status of generalization studies in behavioral treatment and admitted that "extensive, wide-ranging, and practical generalization was not often noted or even sought" (p. 352). Yet, Davidson and Seidman (1974) stressed the need for collection of information about longitudinal effects and argued for the importance of enduring change within and of the social milieu.

One set of measures relevant to a larger community impact of treatment programs is the extent to which trainers (or teachers) who learn behavioral techniques apply such efforts in other settings, with other trainees, and/or at other times.

An applied behavioral project, PREP (Preparation through Responsive Educational Programs), has conducted four-year followup assessments on former student participants of a large-scale treatment program (Filipczak,

Archer, Neale, & Winett, in press). PREP has extended its followup efforts to include the trainers as well as the trainees. This paper reports on outcomes from a study collecting information on the development and maintenance of skills by public school staff who participated voluntarily in PREP.

Student Learning Program

This followup is an outgrowth of PREP's federally-sponsored, school-based applied research project. The student and teacher training occurred during school years from 1971 through 1977. Adolescents were recommended for PREP's one-year program by school staff on strong evidence of academic and/or social problems: failing grades, frequent disciplinary referrals, chronic absenteeism, suspensions, poor performance on standardized tests and classroom learning tasks, or contacts with the police or other juvenile problem agencies. PREP matched student skills and problems to specific entrance criteria, solicited parent and child consent, and developed experimental and comparison groups as required for research purposes.

Over these six years, PREP was tested in three different schools in three different school jurisdictions (suburban, rural, and urban) of a major east coast metropolitan area, with more than 700 students (Filipczak, Friedman, & Reese, 1979). PREP's work in diverse settings with large numbers of students was an attempt at multi-setting validation for the program.

PREP applied four distinct but interrelated learning components:

- Academic training in reading, English language, and mathematics.

- Social or interpersonal skill training.
- Family liaison and skill training.
- Teacher and school staff training in conduct of most phases of the program.

PREP remained at the suburban school for two years (Project Years 1 and 2); at the rural school for four years (Project Years 3, 4, 5, and 6); and at the urban school for three years (Project Years 4, 5, and 6). Participating teachers were free to terminate their involvement at any time. Their average term of work with the project was between one and two years. After PREP left each school, it maintained informal contact with both the administrators and participant teachers.

School Staff Training

The school staff training varied across the sites in both its focus and means of implementation (Frielman, Filipczak, Archer, & Fiordaliso, 1976). Common to all sites was a one- or two-week pre-service workshop on behavior concepts and their use in PREP procedures and curricula. Thereafter, training for the sites differed considerably. At the suburban school, teachers worked directly alongside PREP staff and participated in daily team data review sessions. PREP staff helped rural school staff in planning, observed in classrooms, and reviewed immediate and long-term data records in weekly private meetings. Urban staff conducted their own classes with limited support from PREP personnel who fed back data on token program effects and posted achievement information on cumulative graphic records. In brief, the suburban school staff followed the explicit model of PREP staff, with little attempt

to fade modeling control; rural staff were helped to follow PREP procedures with limited pre-service and classroom modeling, and received systematic feedback on class performance; and urban staff used elements of PREP that suited their intentions and received help in creating a reinforcing social and academic atmosphere.

Table 1 lists the specific component procedures of PREP that are examined in this paper and notes the extent to which each formed assessable training objectives at each PREP site. These components are separated into teaching and behavior program practices that PREP required and trained teachers to use in conducting PREP classes (and related ancillary efforts).

Insert Table 1 about here

Clearly, the emphasis on specific teaching components of the program different among sites. But, there are few maximum contrasts (high versus low emphasis) among sites for most of the teaching practices. The only clear contrast is between the suburban site and the rural and urban sites on use of classwork charts (posted achievement recognition)--one example of the urban and rural programs' reduction in emphasis on immediate and tangible reinforcers and reliance on other means of feedback.

Contrarily, high contrasts in behavior practices were revealed among the three sites, dependent on school setting and specific objectives. Overall, the urban school's program emphasized the behavioral

more than the teaching components. The suburban school's program gave little emphasis to systematic behavior modification procedures, but maintained a point economy with tangible reinforcers. The rural program gave little emphasis to systematic data gathering from non-PREP classes and use of tangible reinforcement. The rural school shows the greatest balance of academic and behavioral component emphasis and seems to stress behavioral procedures more likely to be used or supported in the normal school context.

Teacher Followup Methodology

A three-phased procedure was used to gather followup information about teacher performance: (a) a self-report questionnaire was mailed to each former school staff participant; (b) a 30% sampling of teaching staff responding to the questionnaire was administered an in-person reliability check 10 months after responding to the original mail questionnaire; and (c) the classroom environment and practices of this same 30% were observed and recorded by an independent (non-project, non-teacher) observer simultaneously with the self-report verification.¹

Thirty-four (83%) of the original 41 school staff were located and mailed a questionnaire after a mean of 36 months after their last contact with the project. Only seven of these staff were still employed at the school where they had originally worked with PREP. The suburban school had closed due to changing enrollment. All staff who were located returned the form.

The mailed questionnaire was composed of five parts. The first probed categorical variables (type of assignment, year of program

participation, etc.) and the types of classes (or other assignments) teachers currently held.

In the second 50-item section, teachers rated the extent to which they used specific teaching and behavior procedures before, during, and after participation in PREP. This permitted an analysis of changes in practice over time, as a function of retrospective self-reports. In addition, the teachers indicated the extent to which each practice was routine in their school at the time of the rating (that semester) to provide an indicator of its school-wide support.

The next section included 10 items in which teachers indicated, by ratings, the quantity of time spent in preparation and other administrative duties coincident with the time periods noted above. Five additional items asked teachers to describe the types of class learning activities that were most common in and outside PREP classes before, during, and after participation in PREP. Additional items asked teachers to relate use of specific types of instructional materials to parallel information on type and quantity of time spent.

The next part requested teachers to write voluntary, original comments about larger-scale or more generalized effects of PREP on their teaching careers.

The last part was a 15-item multiple-choice quiz on applications of behavioral concepts in the classroom. It was included to provide a general idea of the extent to which the teachers were able to use behavioral concepts and terminology in an applied context.

At the end of the questionnaire, teachers were asked if they would permit followup staff to call or visit them at their school to confirm and discuss items of the self-report. All of the teachers who returned the form gave this permission.

A total of 11 teachers were visited by an independent observer to gather information to confirm ratings given on the self-report. Nineteen items from the original self-report formed a self-report reliability check filled out by teachers during the interview. The independent observer gathered information about the use of 20 practices in the classroom during the interview and confirmed it by visual evidence in the teachers' classrooms, without making oral inquiry. These observation and report procedures provided checks across the internal structure of the independent observer's instrument and agreement measures with the original self-report. A second independent observer participated in two of the teacher visits to obtain inter-rater agreement estimates for the independent observation procedure.

PREP hoped to use the items and responses solicited by each of these self-report and observation instruments to determine whether its training and use of its procedures were associated with disruption of teachers' prior practices, continuation of their prior practices, short-term generalization, or long-term maintenance of training.

All data in this followup were collected by staff who did not participate in the original training effort. The data were reduced through computing routines of the Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975).

The data presented in this paper include 42 of the 50 teaching and behavior practices from the original self-report questionnaire. Six of these items were eliminated from the analysis because they received the lowest emphasis as objectives in the training at the three school sites. Two items were excluded as they served only as validity checks. No school staff member indicated that either of the two validity check items constituted part of the training objectives.

Results

The results from this followup were analyzed to provide information in seven areas: (a) the extent to which schools supported use of PREP program procedures; (b) differences in perceived time and effort required for teaching in PREP; (c) the degree to which teachers maintained use of these procedures; (d) differences that existed between the maintenance of teaching and behavior procedures according to schools, type of teaching assignment, or knowledge of behavior principles; (e) the overall differences on maintenance of procedures; (f) the independent verification of evidence provided about current classroom practices based on PREP procedures; and (g) self-reported changes in teaching philosophy and methods.

Extent of School Support

Teacher ratings of school-wide support for teaching and behavioral procedures stressed in PREP training are presented in Table 2. Procedures shown as receiving heavy support were defined as exceeding approximately one standard deviation from the mean of rated responses by all teachers in the sample.

Insert Table 2 about here

In only two instances were significant between-school differences observed on the level of support provided these procedures. These were "recognizes improvement," where teachers from the suburban school reported less support for public recognition of achievement or improvement in their current schools (Kendall's Tau C significant at .03 level of confidence); and use of "activity reinforcers" (non-tangible), where the rural school staff reported a greater incidence of this procedure (Kendall's Tau C significant at .02 level of confidence). Neither of these practices was rated as supported heavily by the public schools in general. Given this modest set of differences, data presented in Table 2 reflecting the combined ratings across schools provide a reasonable summary of all responses.

The teaching practices heavily supported in the represented schools seem related to preparation for instruction (diagnostic and achievement tests, written lesson plans, and use of specific educational objectives). Support for achievement recognition may be less understandable, but parallels trends in developing effective non-tangible reinforcers in public school settings. Those procedures rated as moderately supported by the schools comprise technological, practical instructional, and reinforcement variables recently developed in the public schools and clearly required in programs such as PREP.

Four of the behavioral practices supported heavily by these public schools (praise behavior improvement, extinguish misbehavior by ignoring, post class rules, and students evaluate the class) are derived directly from PREP classroom behavior management procedures. These are not not necessarily featured in traditional teacher training programs, nor are they high on the list of teacher-practice goals developed by principals and supervisors. Use of individual behavior programs, data from other classes, and PREP teachers helping other staff seem important to the larger program development and generalization issue. Interestingly, each of the seven procedures rated as having moderate support by the schools incorporates a technique for the implementation of recordkeeping essential to the development of a systematic behavioral program in the public schools.

While these results do not imply radical change on the part of the public school, they illustrate a condition where teachers trained in behavioral principles and procedures admit to having some substantial support by the schools in general for application of that training. This may be a recent development that hopefully will become a future trend.

Changes in Perceived Time and Effort for Teaching

One of the issues of concern in any program of social change is the differential quantity of time and effort demanded to carry out the newly trained roles and tasks. In this followup, 21 of the former PREP teachers rated levels of time and work they perceived themselves expending in classes before, during, and after participation in PREP. These descriptive data are shown in Table 3.

Insert Table 3 about here

Respondents recounted that the time and effort they spent preparing for classes was highest before and after PREP, and that PREP required the least expenditure of such time and effort. However, recordkeeping in PREP required more time and effort than classes either before or after PREP. Teachers amplified these ratings with comments about the "tradeoffs" of using PREP's already prepared and sequenced instructional objectives and curriculum and the substantial recordkeeping and analysis they necessitated. Most teachers felt this trade was "even" and noted that use of prepared curriculum, to be effective, must be accompanied by extensive recordkeeping and analysis--counsel worthy of repeating for all behavioral programs in public schools.

Practices Continued After PREP

The teachers reported that they continued to use 11 teaching practices and 11 behavioral practices at high rates after the project. These 22 practices are listed in Table 4, discriminated into those that teachers learned during PREP, used in PREP, and continued at high rates thereafter; and those used before participating in PREP and continued at high rates thereafter. The criterion used to define "high rate use after PREP" for this purpose is the upper one-third of the ratings given by teachers from the "during" and "before" PREP use. A more intervally-scaled criterion is applied later.

Insert Table 4 about here

The number of practices that the teachers began during PREP and that they continued after PREP is slightly less than those begun before PREP involvement. The largest discrepancies are shown in the interaction between the before/after starting point and the teaching/behavior practice categories, not accounted for by differential support by the schools. These differences seem reasonable, however. For example, the impact of social learning theory on teaching practice has been pronounced for more than 10 years, yielding potential effect on the teaching practices begun before PREP involvement. Contrarily, in the same time period, few behavior modification practices were offered for group classroom use by teachers outside special education. Also, the particular skills cited as learned in PREP would be reduced in type and number as a function of what had been learned about such teaching practices before PREP. Finally, behavioral practices would be more likely to be learned in PREP because of the lack of stress placed on them in other training. Each of these explanations is, however, speculative and based on small-scale differences between categories.

These practices are only ordinally related to each other and to other skills learned in PREP. Their relationship to other performances practiced by teachers in the classroom is unknown. Further, as noted in Table 4, it does not appear that maintenance of skills learned either before or during PREP is dependent on support from the school.

These performances can be viewed, at best, as basic descriptors of what teachers reported as important retention of practice after PREP. The criterion used to include variables on this list captured practices that, at minimum, 15% of the responding teachers reported as having been maintained.

Differences on Site, Quiz Score, and Teaching Assignment

Data on teaching and behavioral practices were analyzed in reference to some major categorical variables that could potentially differentiate between high and low continuation. The data tables that follow include only those variables where clear differences exist between classes of the categorical variables. Table 5 presents outcomes for the teaching practice continuation as reported by the polled teachers. Because of the low response rate for the urban school, the school comparisons are based on suburban and rural teachers only; however, urban teachers are included in both quiz score and teaching assignment analyses.

Insert Table 5 about here

The emphasis given in PREP's training program to certain teaching procedures and the extent to which they were maintained (on the average, across all PREP sites) serve as rough guides against which to assess the relative importance of the differences according to categorical variables. Clearly, no consistent pattern emerged about the effect of training emphasis on eventual teaching procedure continuation after PREP.

However, substantial differences were evident between the suburban and rural school sites on the extent to which specific teaching practices were maintained after the teachers terminated work with PREP. All but one of the comparisons where differences exceeded the .05 level of confidence were in favor of the rural school teachers. In addition, those procedures where marginally significant differences were obtained also favored the rural school group. The rural school teachers were found to significantly excel on those variables where an overall higher percentage of continuation was evident. However, two issues cloud the overall higher performance of the rural school teachers. First, a higher proportion of language teachers (see discussion below) are included in the rural school sample than in the suburban, and the better performance of language teachers may be a partial artifact of this interaction. Second, the suburban school teachers have been disassociated from PREP for slightly more than 1-1/2 years longer than those teachers from the rural school, potentially introducing a temporal bias. Despite these problems, the outcomes from the rural school appear too sizable to dismiss and will be studied further.

Analysis of behavior quiz score differences are intriguing, but not supportive of behavior principles training. Table 5 notes that five of the six significant differences favor the group who scored lower on the behavior quiz. At face, such results would not attest to the positive effects of cognitive behavioral training. This result may not be surprising in light of the fact that the teaching practices of concern are less bound to purely behavioral principles.

Examination of the maintenance of teaching variables with regard to the subject area assignment held in PREP by the teachers revealed few differences. However, each difference found favored language arts (i.e., reading or English language) teachers. Again, none of these differences was clearly associated with either high or low continuation scores.

Data from the influence of these categorical variables on the continuation of behavioral practices in the classroom show few total between-group differences; provide additional support for the superiority of the rural school program; and raise added questions about the relationships among quiz score, teaching assignment, and continuation of procedures (Table 6).

Insert Table 6 about here

Both the percentage continuation and the emphasis accorded these variables in the initial training support earlier contentions that behavioral procedures were less related to teacher's later classroom practices than were the teaching variables.

None of the differences on continuation of behavioral practices was in favor of the suburban school teachers, supporting differences on the teaching practices previously noted. However, the differences favoring the rural school in this instance were generally on practices that were continued less after initial training. In addition, these differences were less substantial than those observed with the teaching

practices (only two exceeding the .05 level of confidence). Other than the "activity reinforcer" difference, each of the differences favoring the rural school teachers focuses on the potentiation or use of performance feedback in the classroom setting. This continuation of behavioral feedback practice parallels heavy emphasis on this area in rural school training.

Differences on behavioral continuation related to quiz scores are difficult to interpret, as well. More of the differences in continuation are related to the high quiz scores, and the high-score differences are related more to the higher continued practices, enabling relatively greater confidence in their importance. However, the low number of score differences and the clear split between high and low quiz scores for continuation of practices offer no substantial basis for inferences about the relationship between levels of behavior knowledge and continuation of PREP practices.

The relationships between continuation of behavioral practice and teaching assignment are also less clearly defined than for the teaching practices. Here, mathematics teachers reported greater continuation of practices in using verbal and activity reinforcers. English teachers, however, reported using rule, reinforcer, and student-involvement practices that supplement the teaching practices reported earlier. However, these differences on behavior procedures by teaching assignment do not appear to indicate systematic variation in continuation.

Several trends appear in these data on PREP-trained combined teaching and behavior practices. For example, the extent to which these

practices were continued in the classes does not seem dependent on the emphasis they were accorded in PREP training. In fact, the majority of practices continued at high rates were not stressed in PREP training. A large percentage of the total number of variables was reported to have been continued at high rates (e.g., 50% or more of the teachers reported continuing one-third of PREP's component features). Assessing continuation of both types of procedures by original school site yielded substantial differences between the suburban and rural school teachers in their current positions. Although potentially an artifact of the shorter time elapsed since training, the rural school staff appeared to consistently exceed suburban teachers in continuation of procedures. As noted in Tables 5 and 6, heavy school support was not consistently found for practices favoring either the suburban or the rural school teachers. Therefore, though the reasons are not clear, rural school teachers more consistently continued to practice the skills that were both stressed moderately to heavily in PREP training and supported by their schools.

The relationship of behavior quiz scores to continuation of teaching and behavioral practice remains curious in the overall analysis. No systematic relationship appears to emerge, favoring either high or low scores, and no particular feature of background variables or artifact of the procedure seems to account for these results. It may be ventured that behavior knowledge in and of itself may serve differential functions in the continuation or maintenance of performance-based skills.

Continuation of eight practices was differentially associated with the teacher's subject assignment after leaving PREP, too large a number to be a function of chance alone. Here, the language teachers seemed to maintain skills used in PREP at higher rates than other teachers. Teachers themselves suggest an explanation, with which PREP staff concur, that language classes (with the exception of reading) were based on a less well-defined set of objectives organized in a loose (often nearly non-existent) sequence. This provided classes where neither the teachers nor the students were able to determine the structure, progress, and goals. Language classes included the most disrupted of all within which PREP worked. Language teachers admitted that PREP offered them a unique, welcome means of bringing control into their classes, a sentiment they echoed at the followup. It appears that, with greater needs, the language teachers adopted PREP methods more rigorously and retained them longer than did the teachers of other subjects.

Overall Differences in Maintenance of Procedure

To illustrate the overall differences in continuation by site, quiz score, and assignment, the variables included in the analysis were used to derive three scores: for all teaching practices, for all behavioral practices, and the sum of both types of practices. These three sets of scores are represented in Table 7.

Insert Table 7 about here

For the summed teaching practices, no significant differences in maintenance were found for either school site or quiz score level. However, language arts teachers did generate higher total maintenance for teaching variables than other categories of staff (confirming data from Table 6 for the abbreviated list of procedures). Maintenance of behavioral procedures was sharply distinguished for teacher type and quiz score. Again, the language arts teachers were found to maintain these procedures significantly better than other teachers. High quiz scores were also strongly related to high maintenance of behavior procedures in the classroom, further confirming data from Table 6. On the maintenance dimension (teaching plus behavioral performances), language arts teachers were again found to score much higher, but no other distinct differences were observed.

Independent Observer Agreement Check

Data gathered by independent observers revealed modest to high agreement between the rating teachers provided on the mail questionnaire and items recorded and observed 10 months later in school.

Using a format closely approximating that of the original questionnaire, 19 items were completed by teachers as a written validation of the mail questionnaire. The agreement observed across all questions that represented actual PREP procedures was 72%, with 92% agreement on the "dummy" (or non-PREP) items. Five items accounted for the bulk of variation, each focusing on specific types of data gathered and fed back within the program. Although no absolute standards apply (Mehrens & Lehmann, 1975), this rate of agreement across 10 months serves to substantiate confidence in the reliability of this part of the instrument.

Other formats used to assess agreement yielded less agreement across the 10 months. Both direct questions asked of the teachers by the independent observer that required corroboration by classroom evidence (e.g., using behavior contracts) and observations made before and during the class (e.g., using activity reinforcers) resulted in agreements approximating 60-63%. The observational procedures may have missed application of practices not in use or in sight at that time. Yet, this discrepancy between reported and observed confirmation should warn against interpretations based on the higher agreement figure.

Agreement between the two independent observers was assessed in two separate school visits. An agreement of 100% was computed between two observers, using a total of 13 before and during class observation items. Agreement of 95% was obtained on items requiring verification by classroom observation of teachers' answers to oral questions. Consequently, relatively high confidence can be placed on agreement figures that were based on observational items within the classroom.

Reported Changes in Teaching Philosophy and Methods

Each one of the school staff wrote responses to open-ended questions indicating changes they perceived in their teaching philosophy and overall method as a function of involvement with PREP. These responses have been grouped by similarity for analysis and, therefore, may present a more uniform picture than warranted.

Three distinct changes in philosophy dominated these composed responses. First, teachers felt they were more likely to search for

teaching alternatives for students who were thought to be unreachable (N = 10). Second, they reported improved ability to discriminate between acceptable and unacceptable behavior, both within and outside the classroom (N = 9). Third, they reported being more likely to place greater emphasis on the use of positive incentive techniques when working with problem students (N = 9). These three reported changes in teaching philosophy account for a substantial proportion of the attitudinal "set" PREP attempted to generate in both its staff and the teachers. The willingness to search for existing alternatives for unreachable students seems to reflect the sense of efficacy and self-confidence shown by effective teachers (Rosenshine, 1971). The ability to discriminate those behaviors warranting teaching from those warranting application of either positive or negative consequences appears to be the first step in successful application of behavior analysis. The use of positive incentive procedures is in keeping with the traditions of behavioral teaching. Other reported changes included increased likelihood of, and better ability to, construct and conduct individualized programs for students (N = 7), to develop effective strategies for crisis management in the school (N = 5), and to provide greater structure and control within the classroom (N = 5).

A great variety of changes in actual teaching method was reported in this composed response item. Three conceptual clusters received high numbers of reference. First, the respondents indicated increased current use of positive rewards in their reinforcement programs (N = 14). They also reported that use of individualized behavior modification

and teaching with their students where they had not used such procedures before contact with PREP ($N = 14$). Ten staff reported substantial use of a wide range of motivational techniques (particularly specific forms of praise and public feedback) in their current positions. Of the total of 108 written responses to the question about changes in teaching method, 46 responses specifically targeted changes in reinforcement, feedback, prompts for reinforcement, or some other form of motivational control.

Summary and Conclusions

This long-term followup on teacher continuation of PREP skills presents mixed results. Certain vagaries in the data may be due to methodological deficiencies in the study itself. For example, although the overall proportion of teachers responding to the followup was 83%, more than half of the information is missing from urban school teachers, raising doubt about the overall validity of conclusions about this site of the training and followup. Second, no objective information has been presented on the performance of specific teachers during PREP, which would have afforded an analysis of change with appropriate covariates. Third, although the agreements obtained between the two administrations of the questionnaire exceeded minimum pre-to-post reliabilities expected for test measurement, reliance on retrospective self-reports of change does not provide the behaviorist with the objective evidence traditionally expected.

However, a range of evidence exists within these limitations that permits a fairly straightforward interpretation of data outcomes.

Practices for which these teachers were trained in PREP are supported differentially by the public schools in which they now work. Generally, those procedures linked with teaching, rather than behavior management, are supported at higher levels. Yet, this support was not found to be critical for the teacher's maintenance of the practices. Although no direct evidence exists for interpretation of this finding, teachers' constructed responses to the open-ended questions indicated that they retained practices if they served immediate instructional ends in their schools and classrooms. This clearly implies that teacher training, to be effective, should provide skills that have immediate and real consequences for application in the classroom.

The followup provided evidence that teachers do not find the use of precise behavioral teaching and class management practices to require significantly more time or effort. Continuation of such practices would appear to depend on guaranteeing minimal time/effort yield, such as PREP did.

A number of interactions were observed between continuation of teaching practice and the categorical variables of school site, behavior quiz score, and teaching assignment. The continued employment of several PREP-trained teachers at the rural school may account for the substantial outcome differences observed over the suburban school, where teachers had relocated after the school's closing. Another possible explanation for this difference may be that PREP's training program in the rural school offered a greater proportion of elements in consonance with the daily practice of the school administration.

Differences on continuation by quiz score do not support the notion that cognitive understanding of behavioral procedures leads to more substantive behavioral practices in the classroom. The several continuation differences favoring language teachers again seems to argue for the conduct of training programs that provide skills that have immediate and sizable effect in classroom situations.

Several changes in teaching philosophy reported by teacher respondents closely paralleled practices that were reported and observed to be continued in their classrooms. These changes fall into clear categories of behavioral theory that are widely generalizable in classroom settings, indicating that a bridge between practice and theory had been formed.

Results from this study should be of interest to those attempting to provide teaching staff of public schools with behavioral training. One theme appears to emerge from all of the analyses: practical training that yields direct performance enhancement for teachers and direct results in their classrooms may be a necessary and sufficient condition for maintenance. Although reported support by the schools and the proximity of other teachers who use these practices is linked to continuation, no direct evidence exists that the environment must be programmed (Baer, Wolf, & Risley, 1968) to facilitate this maintenance. It is possible that programmed environmental support may not be necessary, as the teacher serves largely as his or her own standard and monitor, using data from the present classroom to confirm or change daily teaching practices.

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Table 1

Level of Training Emphasis for PREP Teaching and Behavior Practices

TEACHING PRACTICES	SUBURBAN	RURAL	URBAN
Individualize - Classes	●	○	○
Praise Work Completion	●	○	○
Teaching Machines	●	○	○
Routine Teacher Help	●	○	○
Standardized Test	●	○	○
Recognize Improvement	●	○	○
Individualize - Disruptive Kids	●	●	○
Pre-Defined Grading	●	●	○
Special Work Areas	●	●	○
Diagnostic Test	●	○	●
Daily Written Assignment	○	●	○
Classwork Charts		●	●
Academic Work Record	○	●	●
Academic Contract	○	○	●
Daily Attendance	○	○	○
Specific Objectives	○	○	○
Recognize Achievement	○	○	○
Peer Aides Check Work	○	○	○
Weekly Quizzes	○	○	○
Written Daily Lesson Plan			○
Weekly Homework			

BEHAVIORAL PRACTICES	SUBURBAN	RURAL	URBAN
Behavior Rating by Teacher	○	○	●
Behavior Record	○	●	●
Individual Behavior Program	○	●	●
Individual Observations	○	●	●
Behavior Contracts		○	●
Student Self-Rating		○	●
Full Class Observations		○	●
Behavior Charts		●	●
Tangible Reinforcer	●		●
Token/Point System	●	○	●
Praise Behavior Improvement	○	●	○
Activity Reinforcer	○	●	○
Field Trip Criterion	○	●	○
Data on Other Classes	●		○
Narrative Reports Home	●	○	
Good Notes Sent Home		○	○
Extinguish by Ignoring		○	○
Phone Calls Home	○	○	○
Post Class Rules	○	○	○
Teacher Help Other Staff	○	○	○
Students Evaluate Class			

●	Heavy Emphasis
○	Moderate Emphasis
	Light Emphasis

Table 2

Reported School Support for PREP-Emphasized Teaching and Behavioral Practices

TEACHING PRACTICES

Standardized Test	●
Diagnostic Test	●
Specific Objectives	●
Recognize Achievement	●
Take Daily Attendance	●
Use Written Lesson Plan	●
Routine Teacher Help	○
Teaching Machines	○
Recognize Improvement	○
Individualize - Disruptive Kids	○
Pre-Defined Grading	○
Academic Work Record	○
Peer Aides Check Work	○
Weekly Homework	○
Individualize - Classes	
Praise Work Completion	
Special Work Areas	
Daily Written Assignment	
Classwork Charts	
Academic Contract	
Weekly Quizzes	

BEHAVIORAL PRACTICES

Post Class Rules	●
Individual Behavior Program	●
Praise Behavior Improvement	●
Data on Other Classes	●
Extinguish by Ignoring	●
Students Evaluate Class	●
Teacher Helps Other Staff	●
Behavior Rating by Teacher	○
Behavior Record	○
Behavior Contracts	○
Student Self Rating	○
Behavior Charts	○
Narrative Reports Home	○
Good Notes Sent Home	○
Individual Observations	
Full Class Observations	
Tangible Reinforcer	
Token/Point System	
Field Trip Criterion	
Phone Calls Home	
Activity Reinforcer	

●	Heavy
○	Moderate
	Low

Table 3

Change in Perceived Time and Effort for Teachers'

Preparation and Recordkeeping

	REPORTING TIME & EFFORT			Mean
	High	Average	Low	
Preparation Time:				
Before PREP	13	8	0	2.62
PREP	8	5	8	2.00
Year After	11	7	2	2.45
Recordkeeping:				
Before PREP	3	15	3	2.00
PREP	11	6	4	2.33
Year After	6	13	1	2.25

Table 4

Teaching and Behavioral Practices Continued by Teachers After PREP

BEGUN DURING PREP AND CONTINUED THEREAFTER	HEAVY SCHOOL SUPPORT
Teaching Practices:	
Use of Special Work Areas	
Praise for Work Completion	
Use of Teaching Machines	
Individualized for Disruptive Kids	
Behavioral Practices:	
Individual Behavior Programs	•
Extinguish Misbehavior with Ignoring	•
Praise for Behavior Improvement	•
Individual Behavior Observations	
Behavior Rating by Teachers	
Good Notes Sent Home	

BEGUN BEFORE PREP AND CONTINUED THEREAFTER	HEAVY SCHOOL SUPPORT
Teaching Practices:	
Take Daily Attendance	•
Written Daily Lesson Plan	•
Use of Specific Behavioral Objectives	•
Recognizing Academic Achievement	•
Keeping Academic Work Records	
Providing Routine Teacher Help	
Using Weekly Homework	
Behavioral Practices:	
Posting Class Rules	•
Record Behavior Data from Other Classes	•
Students Evaluate Class	•
Teacher Helps Other Staff	•
Phone Calls Home to Parents	

Table 5

Difference in Teaching Practice Continuation by Site, Quiz Score, and Teaching Assignment

TEACHING PRACTICE	HEAVY TRAINING	CONTINUATION (All Sites)	SCHOOL (Suburban or Rural)	BEHAVIOR QUIZ SCORE (High/Low)	TEACHING ASSIGNMENT (Language, Math, Social)
Diagnostic Test	•	65%	.03-Rural		
Recognize Achievement		62%	.01-Rural	.08-High	
Routine Teacher Help		59%		.05-Low	
Weekly Homework		56%	.04-Rural		
Academic Work Record	•	56%	.08-Rural		.06-Lang
Recognize Improvement		56%	.04-Rural		
Specific Objectives		56%	.007-Rural	.04-Low	
Standardized Test	•	53%	.08-Sub	.04-Low	
Pre-Defined Grading	•	50%		.03-Low	
Special Work Areas	•	50%	.05-Sub		
Academic Contracts		47%	.08-Rural	.004-Low	.08-Lang
Weekly Quizzes		47%	.06 Rural		.06-Lang
Peer Aides Check Work		44%	.008-Rural		
		Mean 53.9%			

Table 6

Difference in Behavioral Practice Continuation by Site, Quiz Score, and Teaching Assignment

BEHAVIORAL PRACTICE	HEAVY TRAINING	CONTINUATION (All Sites)	SCHOOL (Suburban or Rural)	BEHAVIOR QUIZ SCORE (High/Low)	TEACHING ASSIGNMENT (Language, Math, Social)
Praise Beh. Improvement		59%		.05-Low	
Students Evaluate Class		53%		.003-Low	.09-Lang
Phone Calls Home		50%		.03-High	.06-Math
Post Class Rules		38%	.06-Rural		.08-Lang
Good Notes Sent Home		38%	.06-Rural	.01-High	
Activity Reinforcer	•	35%	.04-Rural		.07-Math
Token/Point System	•	35%			.06-Lang
Narrative Reports Home		29%	.09-Rural		
Tangible Reinforcer	•	26%		.08-High	
Behavior Charts	•	24%	.01-Rural		
Student Self-Rating		18%	.08-Rural		
		Mean 36.8%			

Table 7

Overall Differences in Maintenance

	OVERALL MAINTENANCE OF TEACHING SKILLS		OVERALL MAINTENANCE OF BEHAVIORAL SKILLS		OVERALL MAINTENANCE OF TOTAL SKILLS	
School	No Site Differences		No Site Differences		No Site Differences	
Teacher Type	Language Teachers Better	p = .04	Language Teachers Better	p = .09	Language Teachers Better	p = .06
Quiz Score	No Hi/Lo Differences		High Scores Better	p = .08	No Hi/Lo Differences	

Footnotes

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¹Copies of all instruments described here are available from the first author.